

Alaska Energy Cost Reduction Program Progress Report

Grantee: Alaska Power Company

Grant # 313-07

Period of Report: Second Quarter 2008 (April 1 through June 30 2008)

Project Name: Eagle Hydrokinetic River Turbine Project (Denali)

Quarterly project activities:

The turbine equipment design continues. UEK completed the turbine design and submitted it to AP&T for review and approval. The engineering and design submittals for the turbine support platform, trash rack, anchor and mooring system are forthcoming. The assembly sketch below in Figures 1 and outline current plans for deploying the turbine. Consideration is being given to; deploying a large buoy upstream of the barge and turbine assembly to provide training of the moorage cable to optimize the barge/ turbine assembly position and a flexible barrier to deflect large debris moving down the river on a trajectory with the barge/ turbine assembly thereby preventing contact with the equipment.

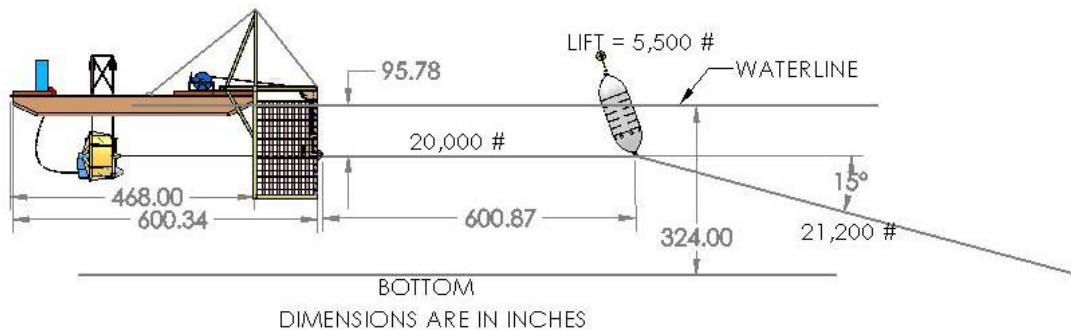


Figure 1 - Barge/ turbine deployment with large upstream buoy mooring system

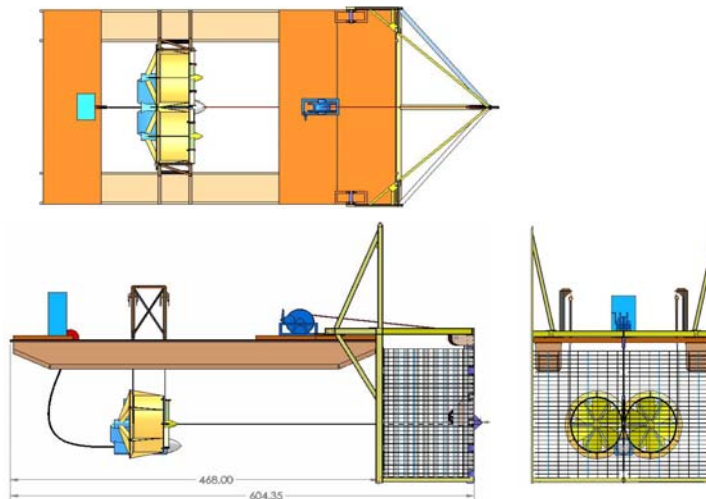


Figure 2 - Barge and turbine assembly details including a positioning hoist and electrical enclosure

AP&T has reviewed the turbine design and is discussing approval with UEK including interconnection and deployment details. Manufacturing and design review will continue through the next several months as the turbine and its associated systems are manufactured.

AP&T staff has carried out an evaluation process to determine methods to perform in stream fishery studies as required by the project permits. Consultations continue with the agencies involved in an effort to determine appropriate and acceptable monitoring techniques. The Yukon River in the area of the City of Eagle poses several challenges, including current high velocities and high turbidity with subsequent low water visibility. Conventional visual fish monitoring techniques cannot be satisfactorily employed in the river mandating AP&T study alternatives finding acoustic monitoring most beneficial. The Alaska Department of Fish and Game (AD&G) uses acoustic monitoring successfully to evaluate the upstream migration of the adult salmon through summer and fall in the river approximately six miles downstream of the project site. The scope of the ADF&G studies do not include monitoring or data collection of the early downstream runs of juvenile salmon or the habits of the local fish species. The Alaska Department of Natural Resources Office of Habitat Management and Permitting requirements include determining the impact of the turbine on the behavior of transient salmon and the local species. To more clearly define the scope fish monitoring AP&T decided to perform base line studies in 2008 to document as much fish behavior as possible. BioSonics (<http://www.biosonicsinc.com>) of Seattle, Washington, was contracted to provide acoustic



Figure 3 - Yukon River June 16, 2008 looking upstream from Front Street in the City of Eagle

monitoring equipment, data collection, and evaluation of the data to determine fish presence, their numbers, species and behaviors in the project area. BioSonics is highly experienced in acoustic monitoring of fish and have participated in other hydrokinetic projects in the USA. AP&T and

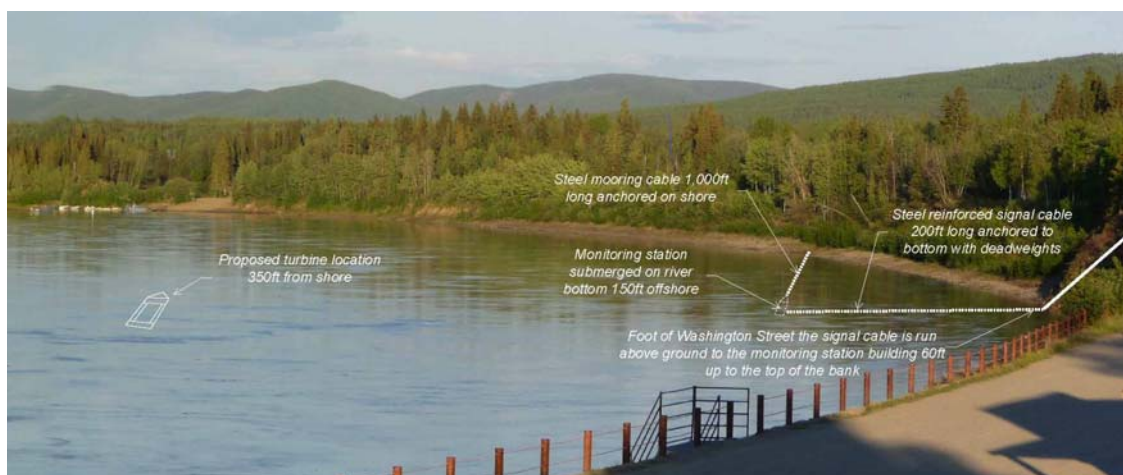


Figure 4 - Turbine and fish monitoring equipment location

BioSonics installed a fish monitoring system at the foot of Washington Street in June (Figures 3 and 4). Data will be collected over the next several months. The monitoring system will be removed prior to icing later this year; and evaluation results will determine future redeployment.

AP&T staff worked with BoiSonics staff to build a platform to deploy underwater equipment (Figure 5). This platform was floated into the river then placed on the bottom by a diver. The Boisonic equipment is connected to small insulated building installed to house the monitoring interface instrumentation. Power and communication cables were trenched into the site from the local AP&T facilities. System conditions will be monitored from the BioSonics offices in Seattle; local AP&T personnel have been trained to provide services as required. The computer is equipped with multiple high volume memory drives. The drives are setup for redundancy. After a period, when the drives are full they will be transferred to the BioSonics Seattle office for data extraction.



Figure 5 – Fish monitoring platform with dual beam transducer and rotator. The platform was deployed by boat and diver to the river bottom 150 feet from the foot of the river bank.

Activities Targeted for Next Reporting Period, Third Quarter 2008:

- Platform design has been completed by UEK and will be submitted for review by AP&T
- Anchorage design continues between AP&T and UEK
- Electrical utility interface design will be initiated by AP&T
- Witnessing of UEK turbine testing at the UEK facilities in Annapolis, Maryland
- Continuation of land base equipment design evaluation
- Acquire a property lease from the City of Eagle to install land based facilities
- Continuation of fish monitoring activities including periodic fish sampling.